

Prime Factors!

ALL numbers except for 1, can be written as a product (answer for multiplication) of two different factors...

Ex. $6 = 2 \times 3$, 1×6

$24 = 1 \times 24$, 2×12 , 3×8 , 4×6

Find all pairs of factors for 36

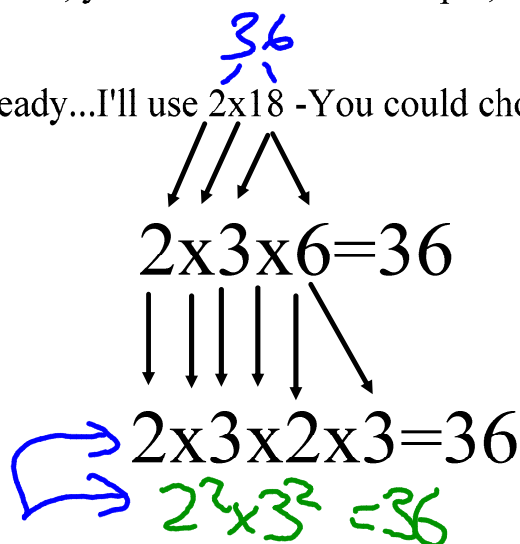
Answer: 1×36 , 2×18 , 3×12 , 4×9

What about instead of a pair of factors, you wanted to find a triple, or quadruple?
(P.S. Who WOULDN'T?)

Use one of the pairs you found already...I'll use 2×18 -You could choose any pair...

3 and 2

In fact, I could keep going
from there, because $6 = 2 \times 3$



I can't go any farther, because 2 and 3 are PRIME numbers.

They cannot be divided evenly by any numbers other than themselves or 1.

That means that $2 \times 3 \times 2 \times 3$ is the PRIME FACTORIZATION of 36. 2 and 3 are the prime factors of 36.

To clean it up, we write the numbers together - $2 \times 2 \times 3 \times 3$
 To clean it up even more, we write it as powers $2^2 \times 3^2$
 Therefore the prime factorization of 36 is $2^2 \times 3^2$

Another way to find the prime factors, is to continually divide by the LOWEST PRIME FACTOR that will go into a number. These are usually 2,3,5. 7 11 13 17

Find the Prime Factors of 60

These are the Prime Factors	2	60	Keep dividing by 2 until the quotient is an odd number.
	2	30	
	3	15	
	5	5	
	1	1	

15 is odd. Try 3 since 2 will not work.
 5 isn't divisible by 3, try 5.
 Quotient is 1. We're done!

Therefore the prime factors of 60 are $2^2 \times 3 \times 5$

$$\begin{aligned}
 & 2^2 \times 3^2 \\
 &= 2 \times 2 \times 3 \times 3 \\
 &= 4 \times 9 \\
 &= 36
 \end{aligned}$$

2) 21
 3×7
 \therefore P.F are
 3 and 7

$$\begin{aligned}
 7^2 \times 2^3 &= 7 \times 7 \times 2 \times 2 \times 2 \\
 &= 392
 \end{aligned}$$

\hookrightarrow 100 P.F are
 2 and 5
 2×50
 $2 \times 2 \times 25$
 $2 + 2 + 5 + 5$

Homework.

Textbook pg 17

1a-d, 2, 3, 4 a-b, 5 a-b, 6-8, 11 and 14

↑
TODAY

1. Write each product as a number in standard form:

a) $2^2 \times 3^2$

b) $7^2 \times 2^3$

c) $5^2 \times 3^3$

d) $2^2 \times 3^2 \times 5$

2. List the prime factors of each number (when listing and not putting as a product, you do not need to list the same number more than once):

- a) 21 b) 14 c) 100 d) 125
e) 19 f) 50 g) 77 h) 96

³Write each number as a product of prime factors. Use exponents where possible.

- | | | | |
|--------|-------|--------|-------|
| a) 48 | b) 63 | c) 400 | d) 16 |
| e) 120 | f) 55 | g) 36 | h) 88 |